STURTEVANT

Mill Company, Boston.

CATALOGUE NO. 69

COARSE, INTERMEDIATE AND FINE

CRUSHERS

1907

STURTEVANT MILL CO. BOSTON MASS.

STURTEVANT

Crushing and Grinding Machinery

Patented

STURTEVANT MILL CO.

MANUFACTURER AND DEALER.

WORKS AND OFFICE

HARRISON SQUARE, BOSTON, MASS., U. S. A.

Only Eight Minutes' Ride from South Terminal Station, Boston, N. Y., N. H. & H. R. R.
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CATALOGUES

THE LARGEST LINE OF ROCK AND ORE

Crushing, Granulating, Pulverizing, Grinding and Screening Machinery Built

From which may be selected machines of the best types applicable to every material and condition.

Principal Machines and the Catalogue number in which they will be found.

IMPORTANT

Machines, conditions, and materials, vary so greatly that we request as complete information as possible when asked for quotations. Then we can answer intelligently, and specify the size and type of machine best suited to requirements:—

INFORMATION REQUESTED

What MATERIAL (to be handled): its CONDITION (wet or dry): its CHARACTER (hard or soft): its SIZE (before feeding to machine): the FINENESS of product wanted: the CAPACITY required in tons per HOUR: what MACHINES ARE NOW BEING USED.

TESTING DEPARTMENT

This department is thoroughly equipped with constructions of *full size*, and tests *opinions* as well as *machines*. Patrons bring all sorts of material to be reduced, and decisions are frequently made of great importance. The output and adaptability of any machine need seldom be a matter of doubt, because tests here can be made as thoroughly as required.

Samples sent will be reduced *free* if transportation is prepaid. Manufacturers do well to come themselves or send a representative to make tests.

STEEL ROCK BREAKERS

BREAKERS AND COARSE CRUSHERS

FOR

HARD ORES AND HARDEST WORK.

FROM *twelve* Crusher types supplied by this company, we select without hesitation for really hard work, and coarse breaking, the Sturtevant Steel Breakers. These have the following advantage over all others.

The rolled steel side frames we are almost tempted to say are *unbreakable*.

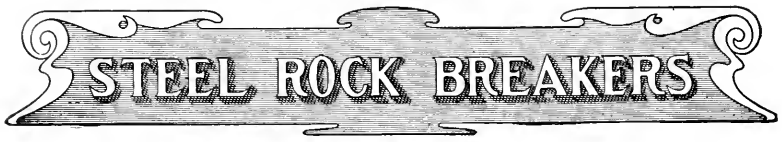
They have *four times* the *strength* of cast iron frames, and many times their dependability.

Sides may be removed quickly, and the whole Crusher, even in largest constructions, reduced to parts that can be carried in *farm wagons*, without strengthening bridges, or special road building.

Freight charges are greatly reduced, because the largest Breakers weigh less than inferior cast iron Crushers of far less ability. Two men can unload the *largest* Crusher made, and set up anywhere without unusual appliances. And *when set up* it has such *rigidity* that even the immense power of the cam and roll cannot distort it.

The front jaw casting is massive and *rabbitted* to the side plates so that the bolts that *merely hold the parts together take none of the shocks of crushing.*

This construction leaves nothing of *rigidity* to be desired, and warrants such strength as all *cam* and *roll* Breakers *require*, and *no others possess*. Faults are not easy to discover, because they do not *develop in use*. We believe this can be truthfully said of no other coarse breaking machine that we know of.



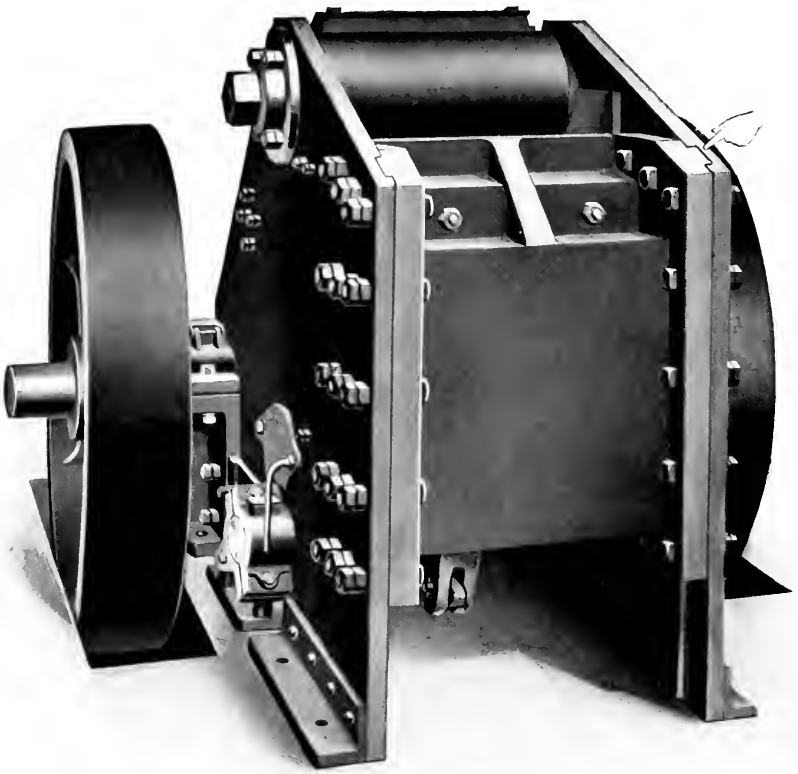
These immensely strong crushers, are driven by a *small* cam working against a *large roll.* That it must lift this *gently,* but with irresistible strength, is evident. For this reason cast iron frames have been found wholly inadequate, unless cast in such masses as in large Breakers can scarcely be transported at all by usual appliances.

It may well be asked why we use such powerful cams and leverages? The answer is not far to seek. Such mechanisms give *easy running,* and such regular and irresistibly smooth action as is seen in no other machines of this class; and there is no danger of frame breakage, because no rock can overcome *rolled steel flawless* side plates that have *twice* the strength of even *cast steel,* and because no flaws weaken them, they are many times more dependable.

That Sturtevant steel side plate Breakers can be trusted, is evident; also that great cost is saved in freight, unloading, teaming, and setting up. This in remote or difficult situations frequently equals the *price* of the Breaker at these works, and this price also is less than that of any other crusher of equal ability, and less strength; for no others have yet been produced of the same *secure rigidity.*

It has nearly been overlooked, that the old Blake connecting-rod and eccentric have long since been displaced in large Sturtevant Crushers. *Pounded-out bearings* are therefore no longer known; the *smooth* cam and roll action, nearly frictionless, and reciprocating quickly on heavy masses of cast iron, produces a machine that runs smoothly. No expensive foundations are required.

STEEL ROCK BREAKERS



(Patented)

Steel Rock and Ore Breaker.

Built in several sizes having capacities from 8 to 150 tons per hour, with jaws set to 2 to 5 inches.

STEEL ROCK BREAKERS

COST.

THE first cost of Plate Steel Breakers is no more than any good Crusher, but its cost set up on foundations, ready to run, is much less than any other, because the freight, foundation, teaming and setting-up expenses are frequently cut in halves. These items are *profits*, sometimes equal to 50% discount from the price of the machine. *Figures* should be considered when buying, almost as much as the great advantages evident in the design of these strong, powerful and trustworthy machines.

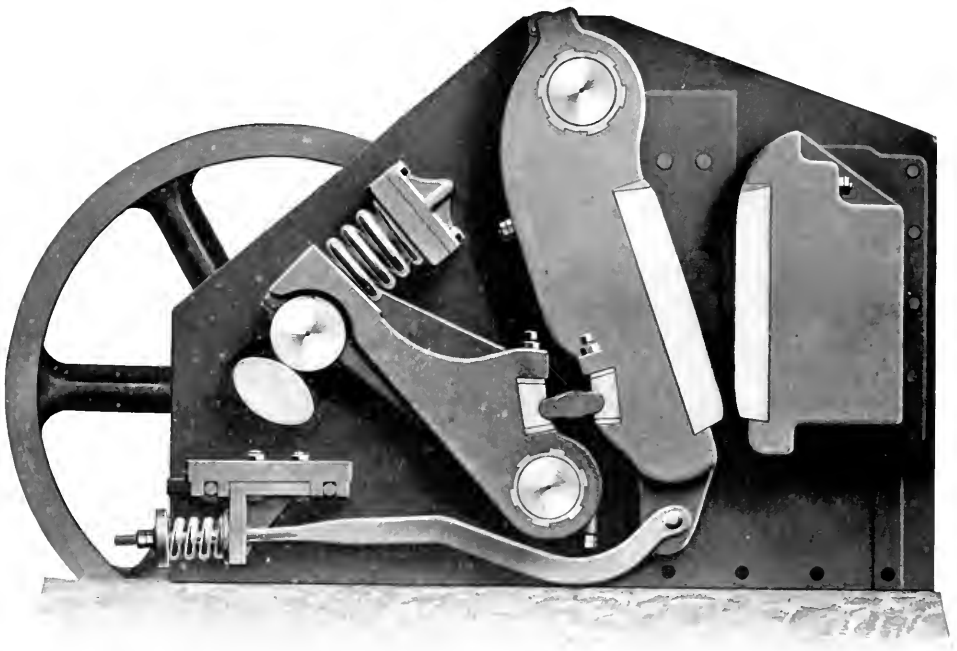
Consider the cost of such items when cast iron Crushers are purchased, frequently weighing from 60,000 to 150,000 lbs. The present freight alone on a 60,000 lb. Crusher to Denver from New York or Chicago is over $700; to San Francisco, or terminal points on the coast, $900; to Arizona points $1300 on carload shipments. A stronger Steel Breaker of equal output, that can be unloaded by two men, would weigh less than 30,000 lbs., thus at least halving freight expenses, and reducing other costs in far larger proportions, because railway carriage is the least costly of all means of moving heavy bodies.

RELIABILITY.

Reliability is of prime importance in Crushers. No machines are subjected to harder uses. They run year by year, twenty-four hours a day in mines, enveloped in dust and dirt; also operated by cheap labor, and often hundreds of miles from the machine shop. A break means a shut down, the loss frequently figuring many times the cost of the Breaker.

Steel side plates mean not *brittleness*, but *strength*, not useless *weight*—but *reliability*. These points are vital. Cast iron can be trusted only in *compression;* or to take the anvil-like strokes of the front jaw.

STEEL ROCK BREAKERS



(Patented)

Sectional View. 11 in. x 26 in. Steel Ore Breaker.

The Jaws and Shields are reversible.

This design embodies Slow Speed—Simplicity—Strength and Rigidity.

STEEL ROCK BREAKERS

Every part of Sturtevant Breakers has been carefully studied. It will be seen that they want nothing in easy running, accessibility, durability, and above all *dependability*. No cast iron Crusher can be favorably compared with these, from any point of view.

Unquestioned ability to endure the *roughest* usage is a quality always appreciated. The steel side plates are *rabbitted* to the massive end castings that take the crushing stresses, *entirely relieving the bolts*, which *only hold the parts together*, and that absolutely *cannot be weakened* by any ore-crushing shock. No cast-iron Crusher can be as reliable.

Small repair bills, and many *unbreakable* parts, give machines of this *side plate* class *first rank* among reliable ore breakers.

POWER.

Cam and Roll Crushers are of such *power* that they especially *require steel construction*, although they have such smoothness of movement; but *plate* steel gives a reliability never before attained. In capacity they have no superiors.

DESCRIPTION.

The illustration shows the construction of Steel Rock Breakers, the Rolled Steel Side Plate, with massive jaw *rabbitted* thereto, thus relieving the bolts from all crushing stresses.

The eliptical cam which is in constant contact with the roll explains the slow speed of this durable machine. By this double Cam and Roller the jaws have *two* reciprocations to *each revolution;* therefore this Crusher has equal capacity at one-half the speed of others

The roll is held against the cam by a strong spring with just enough pressure to keep it in contact. The toggle has only a slight movement, and is therefore much more durable than other toggles. The swing jaw is held back on the toggle by the end spring. The arrangements for oiling, for adjustments, and for replacing parts are unusually perfect.

The distance between the jaws is regulated by the length of the toggle and several are supplied with each machine.

STURTEVANT STEEL ROCK AND ORE BREAKERS.

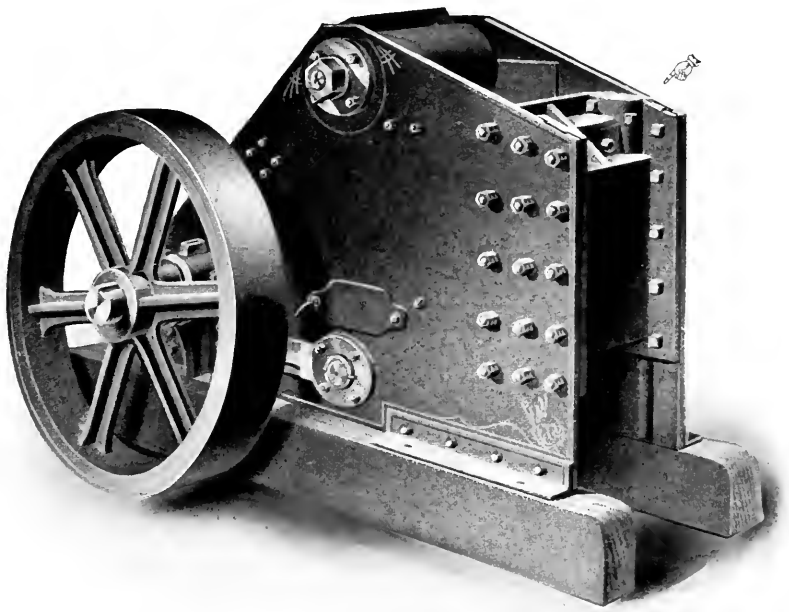
Size Jaw Opening in.	Capacity in tons per hour Jaws set apart 2 inches	Horse Power Approx.	Speed rev.	Pulley in.	Approx. Weight of Heaviest Piece	Approx. Weight lbs. Nett.	Approx. Weight lbs. Gross	
*Blace $7\frac{1}{2}$ x 13	8 to 12	12	170	38 x 8	730 lbs.	6,000	6,500	
*Bleedo 9 x 15	12 to 18	15	155	48 x 9	1,190 lbs.	8,500	9,600	
*Blplex $10\frac{1}{2}$ x 22 Duplex	18 to 30	20 to 25	150	†48 x 8	2,000 lbs.	13,000	14,000	
*Bldfp 11 x 26	25 to 40	25	140	†60 x $9\frac{1}{2}$	2,530 lbs.	19,000	21,150	
*Bodkin 18 x 36	45 to 75§	50 to 60	Built to order			35,000	38,000	
*Bodpex 18 x 72	90 to 150§	100 to 125	Built to order			60,000	65,000	

*Code Word.
†Belted from both fly-wheels. §3 to inch.

Subject to change without notice.

These Crushers are ordinarily fitted with chilled jaws but can be fitted, if desired, with manganese steel jaws at an extra cost.

STEEL ROCK BREAKERS



(Patented)

9 in. x 15 in. Steel Rock and Ore Breaker.

The jaws and shields are reversible.

Lightness, strength, slow speed and smooth running combined,

ROCK SMASHER

INTERMEDIATE BREAKERS.

The Intermediate Crusher is acknowledged to be necessary for high efficiency in ore reduction. The product of the regular ore Breaker is too coarse for Rolls, Stamps or Grinding Mills to work on economically, and it therefore is always good practice to further reduce the Breaker output in a "Smasher" to one inch and finer before feeding to the finishing machines. Bear in mind that crushing is unfortunately the only step in rock reduction that is not *costly* and it is therefore of prime importance to make the crushing machine work to its limit of usefulness.

ROCK AND ORE SMASHER.

This is truly a *smasher*, and when it is seen reducing in unusual quantities the hardest rocks and ores, the appropriateness of the name is not questioned. It is a machine of the greatest ability, and operates with a smooth and easy movement never seen in crushers having connecting-rod and eccentric action. No Crusher of the Blake type *can do this work at all*, because none can crush as *fine* without clogging.

It will be noted that the jaw opening at the top is *7 inches*. If opened wider, the *weight* and *cost* would be enormously increased to produce the same output. This Breaker has been carefully studied, and the usual *wide open* and *shut* movement at the jaw discharge has been nearly eliminated. With that (*usual*) action, regular *fine* crushing was absolutely impossible, without the addition of *screening* and *return* appliances. If the jaw of the Smasher is set for *one* inch outputs, the resulting product is *fine*, and with little oversize; and it never clogs when working suitable ore.

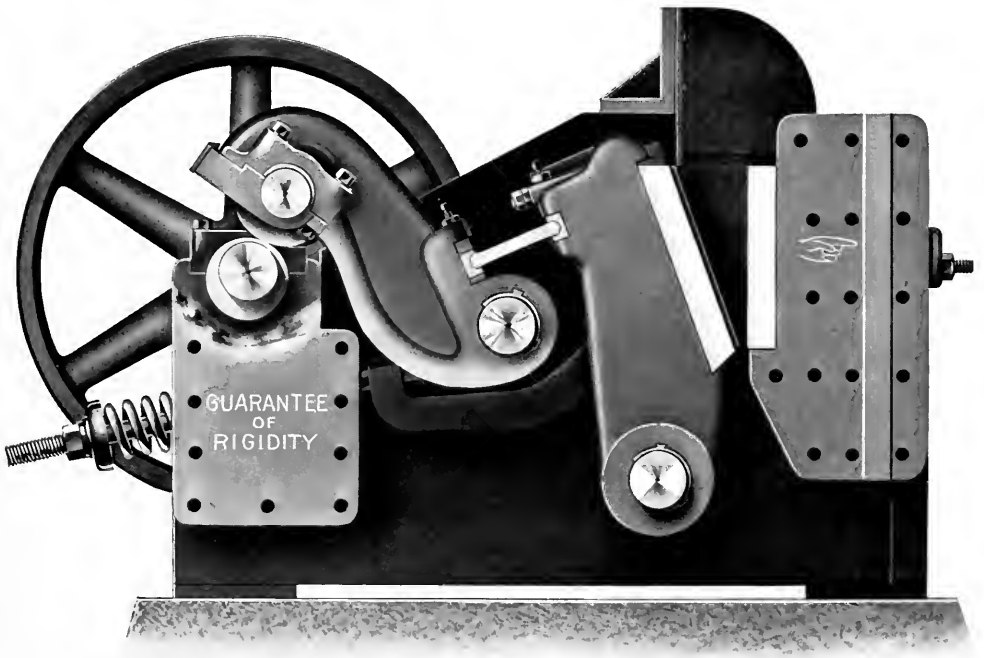
Sturtevant Crushers represent the simplest powerful machines constructed for this work. They are certainly the most durable. The cut shows clearly the massive *rabbitted* parts that secure the reliable steel side members. The roll shaft carried by the crushing lever is secured in dustless bearings, exactly such as have given Sturtevant *Crushing Rolls* their wonderful endurance under hardest mine conditions. It will be noticed also that the *toggle* has almost *no* swing movement, and replacement of this part is therefore seldom needed. The jaws in all these Crusher designs are *reversible*, as also the shield plates; and the corrugations, (if any,) of the jaws may be changed to suit the requirements of the work to be done. The superior *accessibility* of parts for removal, replacement, or transportation is evident.

USES.

For mining, or other industries where rock or ore must be broken fine, *Smashers* find a large field of usefulness. Only the largest and most expensive Rolls can grip effectively ores fed to them coarser than 1½ inches, and no coarse Breaker can produce this size without cumbersome Screens and Elevators to separate and return. A *Smasher*, on the other hand, can supply the Rolls *generously* with material crushed *directly* to *one inch* and less, and without the use of any auxiliary machinery whatever. This generally results in discarding the first set of coarse crushing rolls. An important saving in all respects.

ROCK SMASHER

The Jaws and Shields are reversible.



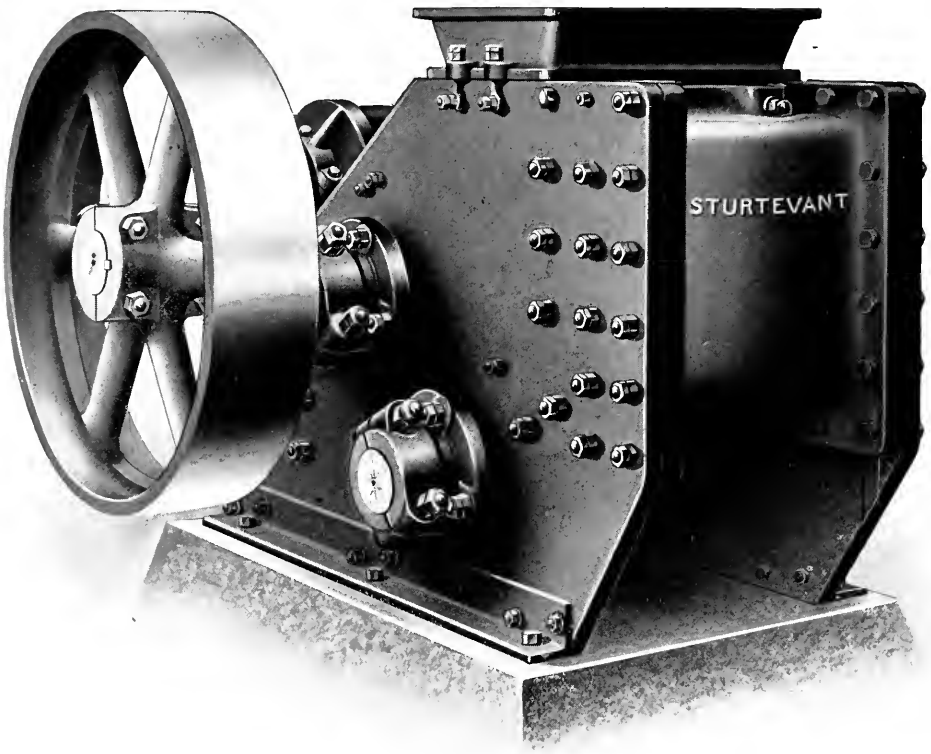
(Patented)

7 in. x 24 in. Rock and Ore Smasher.

An intermediate Crusher of great ability.

Crushes to 1 inch and finer.

ROCK SMASHER

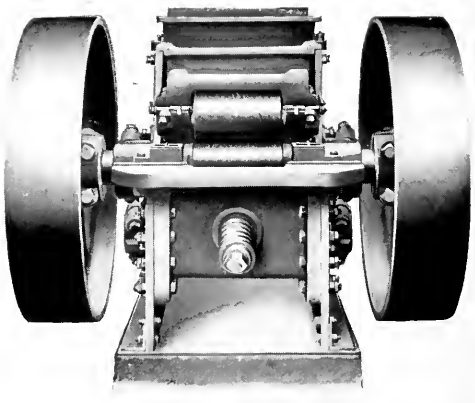


(Patented)

7 in. x 24 in. Rock and Ore Smasher.

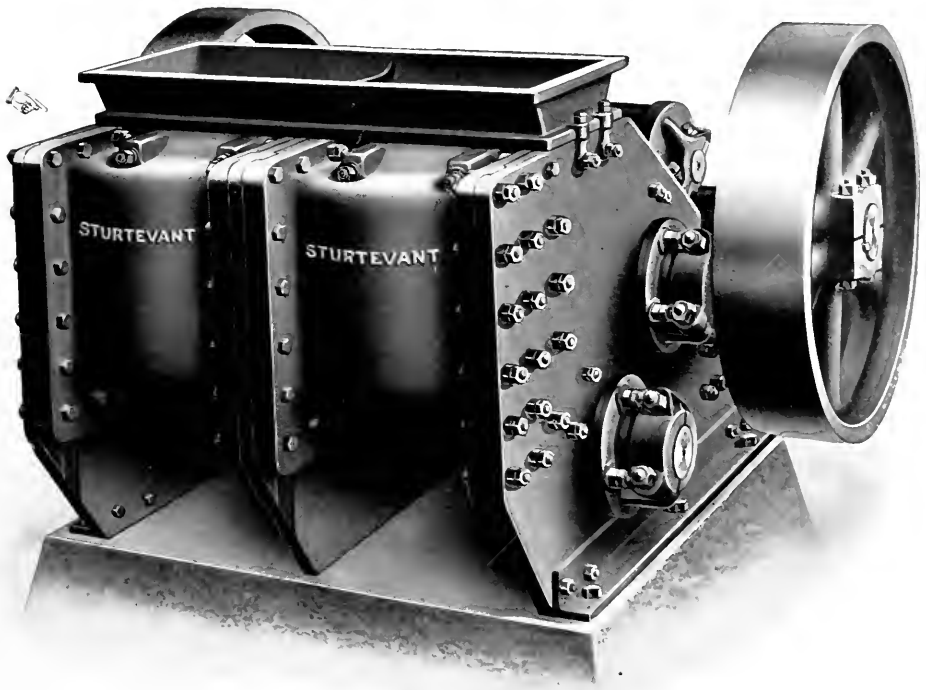
Unbreakable Steel Plate Construction.

No ore too hard for it to crush fine.



(Patented)

ROCK SMASHER



(Patented)

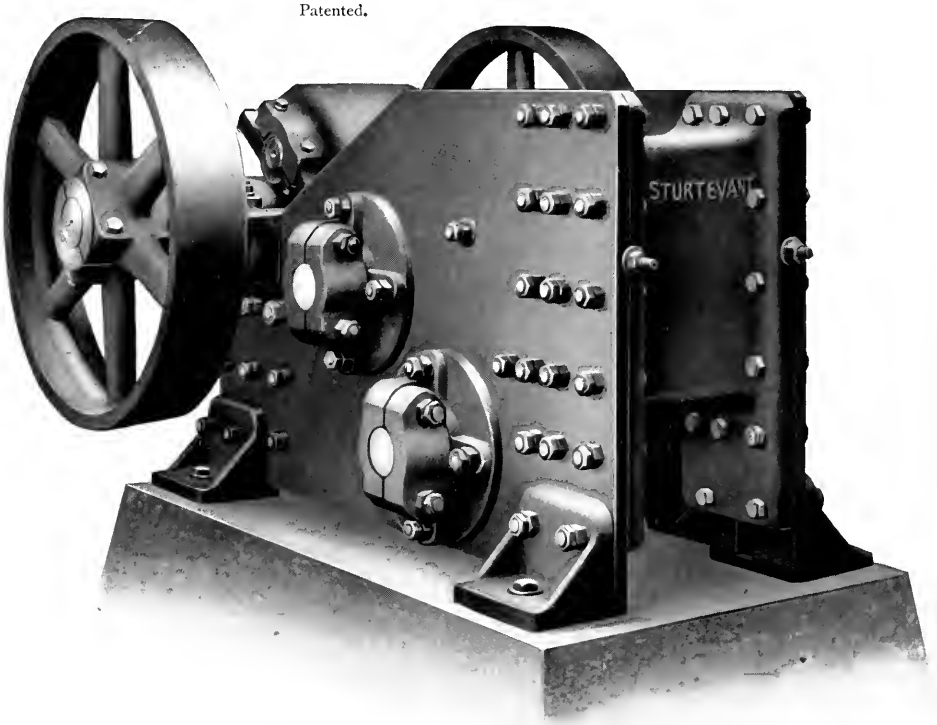
7 in. x 48 in. Duplex Rock and Ore Smasher.

Large Capacity—Fine Output. Hoppered jaw opening to allow Automatic feeding.

This machine is without doubt the best Crusher ever produced. It can be made of *any size*, and in all sizes is *portable*; and with a strength never equalled. The *cam* and *roll* cannot safely be used in cast iron, or cast steel Breakers without a great increase of their weight. But in *these* machines the side plates hold beyond the possibility of weakness, and the great power of the cam and roll movements only result in making the machine *easy running*. These Crushers are *balanced;* no others run *quietly*. They are all *portable*. Even in very large sizes a farm wagon and a pair of horses can carry their parts over common roads.

ROCK SMASHER

Patented.



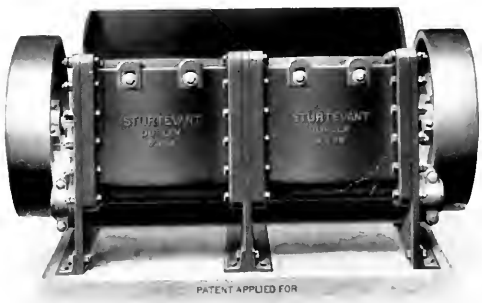
PATENTED IMPROVEMENTS

These Side Plate Crushers are distinguished from all others by their patented *massive rear* castings, which, by holding the plates as rigidly at the *back* as *front*, absolutely prevent deformation of the frame, however hard the crushing conditions.

This massive rear casting also *carries the driving shaft in bearings absolutely independent of the frame.* This is another important feature of Sturtevant design. *The driving shaft is always in perfect alignment.* No crushing stress can affect this. These and other features are carefully protected by patents, and it is safe to say that no other Crusher can be had that is so rigid and dependable. The parts are bolted together, *but these bolts do not take the stresses of rock breaking*, because the anvil jaw casting is *rabbitted* to the side plates, and takes the shocks. *The bolts merely bind the parts together.*

These Crushers have but *one* toggle, this has almost no motion and therefore wear is trifling. It only *communicates pressure.* Immense *power* is obtained by the action of the small *cam* against the *lever's* large *roll.* This simplest of all power combinations is much more able than is needed for rock breaking, but makes running admirably smooth and easy. These cam and roll Crushers run more quietly than any others. Breakers of the *Blake type* are sure to shake everything about the plant by the violent reciprocations of their massive pitman parts.

ROCK SMASHER



The *Cam* and *Roll* operates without *noise* and practically *without wear*. The ample surface of the long shaft bearings resists successfully any force that even the powerful *cam* can exert in crushing the strongest rocks. The surface speed of parts is *low*. The durability of a properly designed cam and roll is never questioned. The entire surface of the jaw is *alive*, and rapid discharge is thus promoted.

The adjustment of the jaw for *fine* or *coarse* work is made by a *change of toggles*, or by *shims* back of the stationary jaw plate.

DUPLEX AND BALANCED

The Duplex, Balanced, Smashers are unlike any others. They have a rolled steel middle plate, as well as side plates. They are in such perfect balance that they run quietly *on the upper stories of any strong mill building*, and of course require only inexpensive foundation on usual mill sites. *All the shafts* have *middle* bearings. No other Duplex Crushers have these much needed supports for the long shafts, and a driving shaft that has *all three* bearings in the *massive rear cross beam* that holds the plates with a *double rigidity*. This great rear casting is scarcely inferior in strength to the front jaw casting. It is plain that no strains can affect the perfect alignment of the driving parts.

The Duplex machines are massive in all parts and have *more than doubled* outputs, because they are in such perfect balance that they can properly be run faster than any single Crusher. They can also crush large outputs *finer*, because in faster running the rock is nipped more frequently before it can escape. The broad base gives firm floor support; and since—heavy as they are—they are yet lighter and less expensive than two single machines, and are equally capable of being knocked down for transportation into difficult situations, they are always preferred by large producers. Because the number of frictional and moving parts is less, Duplex Crushers require less power to run than two separate machines. They are certainly *better than any single machine can be.*

They can be made *of almost any size.* They are patented, and cannot be duplicated. The improvements already noted are of such importance that they will not escape the notice of the most careless buyer. We invite criticism of these remarkable balanced Crushers; bad points will be hard to discover.

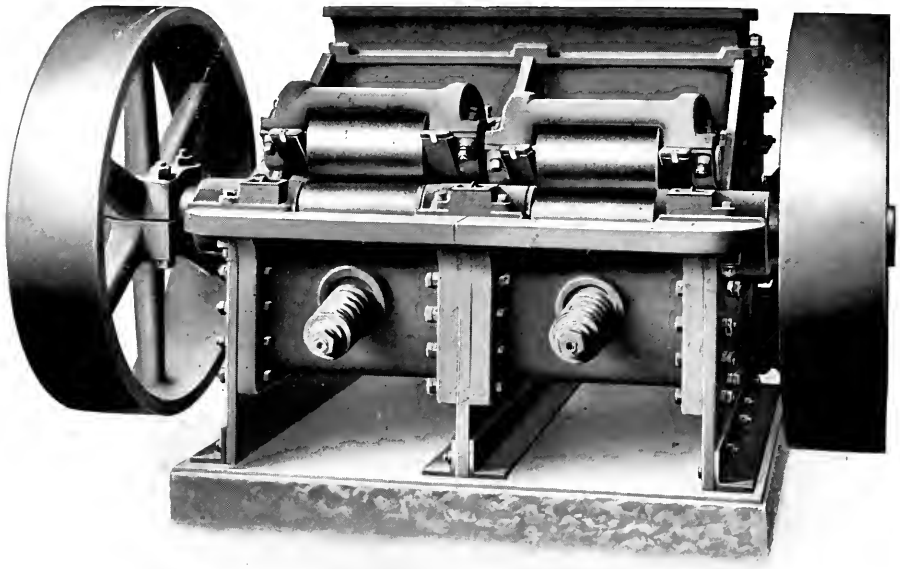
DESCRIPTION

Crushers of this type can always be reduced to their *smallest parts* for transport. Any workman can put them together.

The importance of partly sectionalizing a machine *increases with size.* Often it is of trifling consequence whether a small Crusher can be taken apart or not, but the really heavy common machine is difficult, and sometimes dangerous to move and always *expensive* to *carry and install*

The *sides* of the large Sturtevant Crushers are all now made of *plate steel.* With *four times* the strength of cast iron, and *twice* the strength of cast steel, it is hard to see how they can be broken by any crushing stress. It is certain they have such *complete reliability* as does not characterize any other Crusher constructions.

ROCK SMASHER



(Patented)

End view of Duplex "Smasher" showing back casting, Cam and Roll, etc.

"Smashers" are built in four sizes, having large hoppers to allow automatic feeding, and with capacities of from six to twenty-five tons per hour. These machines embody all those features that have given Sturtevant productions their reputation. The superiority of the *cam* and *roll* over the *pitman* is so evident that its demonstration in so many trying situations did not come as a surprise to engineers. It is curious that anybody should have put a *pitman* in any machine required to do the severe work of rock reduction.

ROCK AND ORE SMASHER SPECIFICATIONS.

Code Word	Jaw Openings Inches	Capacity per hour Jaws set to 1 inch	Horse Power Avg. jaw setting	Speed	Pulley	Approx. Length	Approx. Width	Approx. Height	Approx. Weight Heaviest Piece	Approx. Weight net	Approx. Weight gross
Advent	6 x 15	6 to 8	10 to 12	300	36 x 6	6ft. 2½ in.	4 ft. 6 in.	3 ft. 6 in.	750 lbs.	6000 lbs.	7000 lbs.
Afger	7 x 24	8 to 12	15 to 20	275	48 x 10	7 ft. 1 in.	6 ft.	4 ft. 4 in.	2100 lbs.	13000 lbs.	15000 lbs.
Adorn	6 x 30 Duplex	12 to 16	20	300	36 x 6	6ft. 2½ in.	6 ft.	3 ft. 6 in.	750 lbs.	10000 lbs.	12000 lbs.
Afice	7 x 48 Duplex	16 to 25	30 to 40	275	48 x 10	7 ft. 1 in.	7 ft. 9 in	4 ft. 4 in.	2100 lbs.	22000 lbs.	25000 lbs.

Subject to change without notice.